Test notes on VT results of cavity TE1ACC001 #03

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2009-4-28

Current test summary

Cavity TE1ACC001 has been measured the third time for testing vertical test system in A0, the cavity was kept in vacuum after the 2nd RF test in IB1.

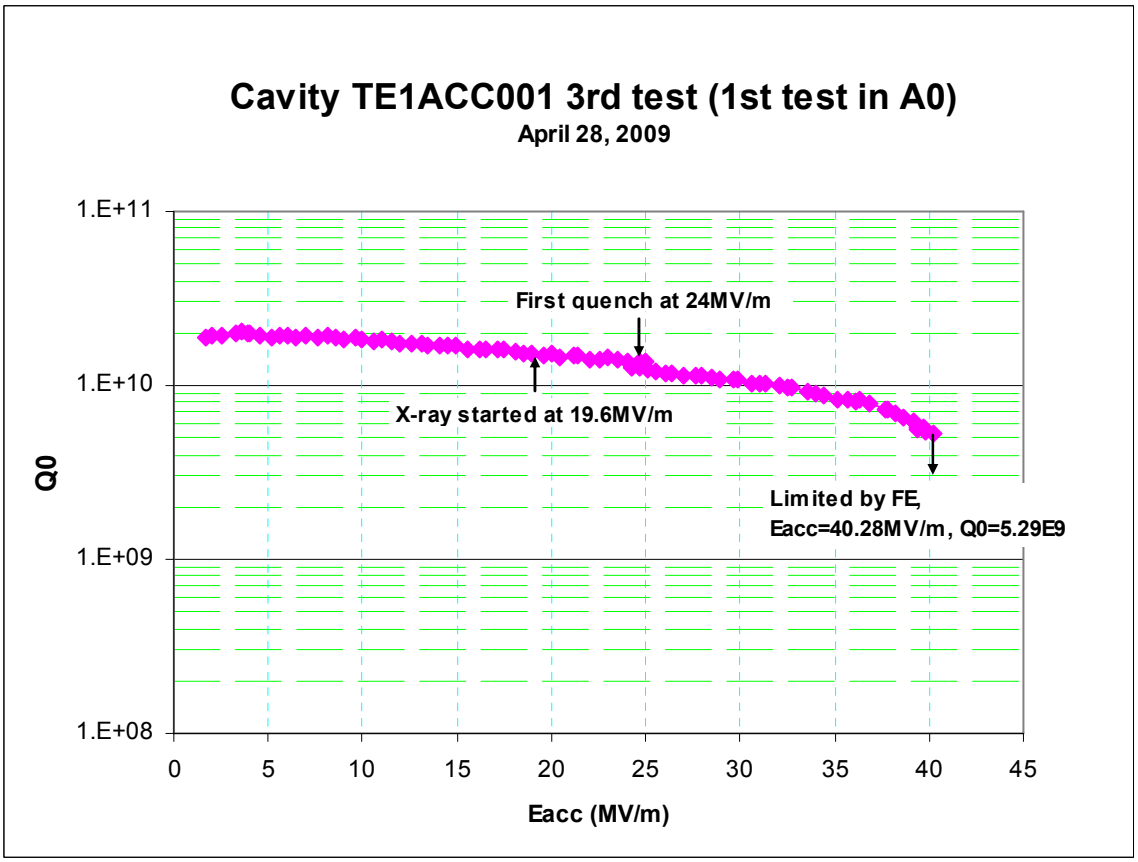

Fig 1 Eacc vs Q0 curve for TE1ACC001 test #3

The cable was calibrated before pumping down, the cable loss factors are Cf=25.10dB, Cr=24.64dB, Ct=6.13dB. The Qt=4.60E12 was measured at Eacc=3.97MV/m, T=2.03K. During the Eacc vs. Q0 measurement at 2K, the X-ray started at 19.6MV/m, and the first quench happened at 24MV/m, but the cavity recovered soon, after that Q0 dropped a little bit, the cavity limited by FE and eventually reached 40.28MV/m, beyond that power level the X-ray detector triggered the system interlock.

Fig 2 shows the test comparison between 2nd test in IB1 and 3rd test in A0, the results correspond.

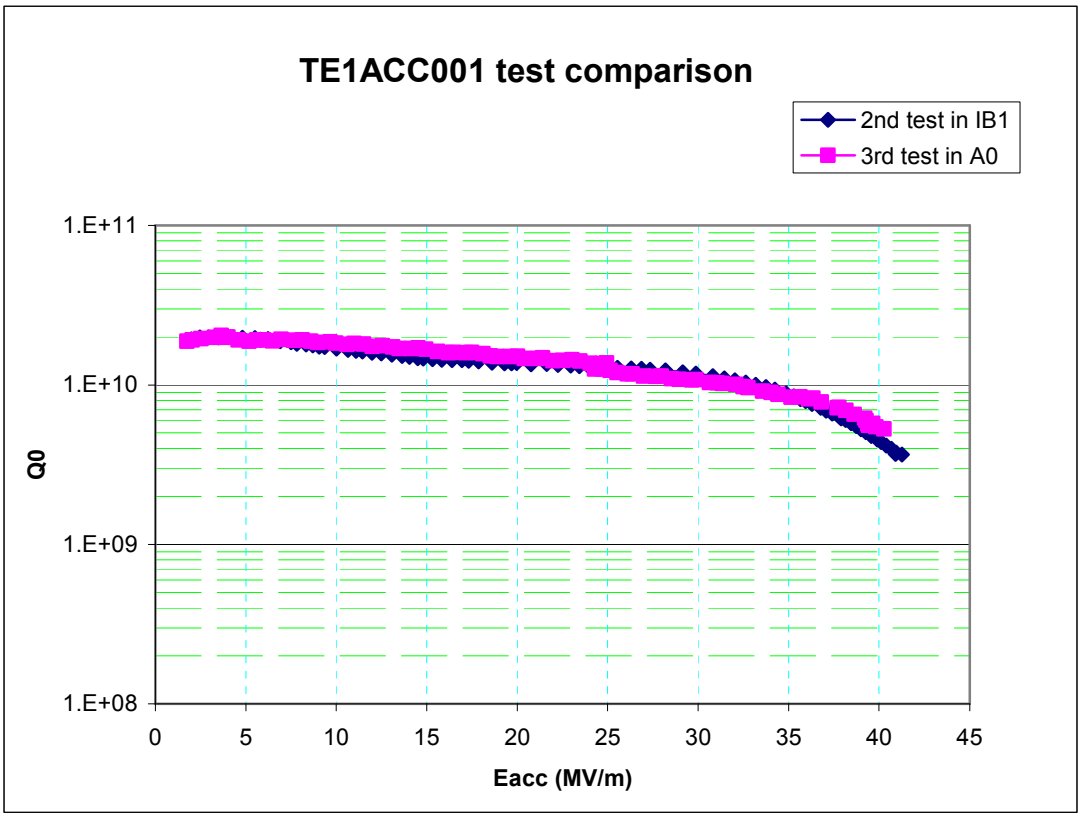

Fig 2 Cavity TE1ACC001 2nd test (in IB1) and 3rd test (in A0) comparison

Previous RF tests

Cavity TE1ACC001 has been tested for the second time after 120 °C in-situ baking.

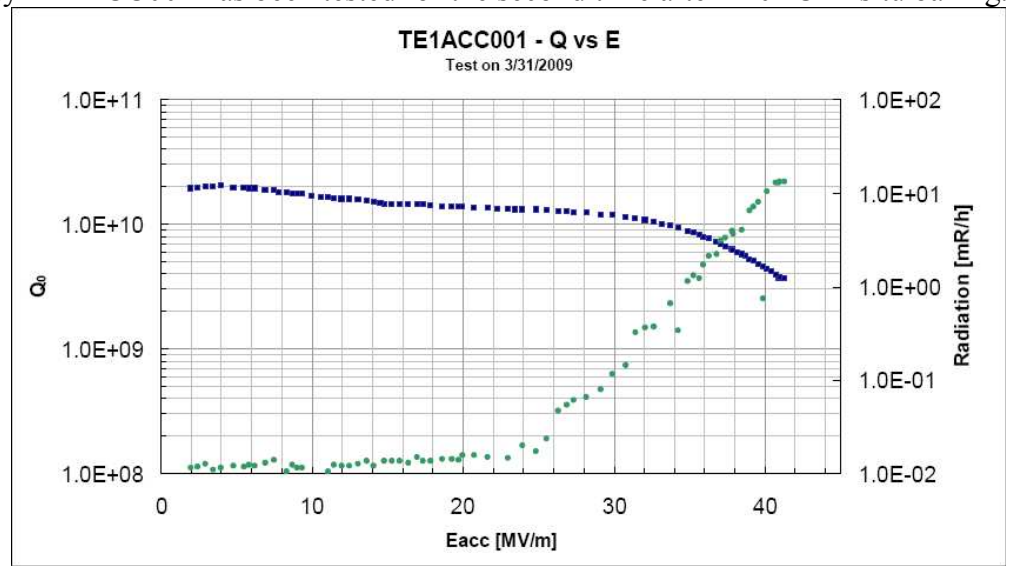

Fig 2 Q and radiation versus Eacc for TE1ACC001 test #2

During the second test on 3/31/2009, cavity was paired to another cavity and cooled down to 2K with no active pumping. CW power measurement was performed without the Q-T measurement. Low field Q_0 was 2.02E10. The test continued without multipacting or

quench until 24 MV/m when above background x-ray started to appear. There was no quench incident all the way to 40 MV/m where processing of field emission eventually lead to 41.3 MV/m. Beyond that power level, both transmitted and reflected signal became unstable to obtain meaningful data. Thus the test was concluded. No diagnostic tool was used on this cavity due to the tight schedule of cavity test preparation. The cavity was kept in vacuum since last test on 3/17/2009. 120 C baking was applied at A0 facility. The worsened x-ray data suggested particulates might be in the cavity which migrated to cell region during the subsequent handling.